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OVARIAN TUMORS

AND

THEIR TREATMENT

(EXCEPTING OVARIOTOMY).

BY

E. R. PEASLEE, M.D., LL.D.

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OVARIAN TUMORS AND THEIR TREATMENT.

MR. PRESIDENT AND FELLOWS:—He must be a very sanguine therapist who believes at the present day, that mere medicines can exert any influence in the cure of ovarian tumors. Medication, skilfully applied, may be productive of great benefit in sustaining the patient's general health, and thus enabling her longer to resist the inroads of the disease; but for its cure, surgical methods alone are of any value.*

I propose to call the attention of the Academy to the treatment of ovarian tumors somewhat in detail, it being the object of the present paper to discuss the various surgical operations which have been resorted to with this end, excepting only the operation of ovariectomy; which I will consider at some future meeting.

Of course, it will be understood that I entirely pretermit malignant diseases of the ovary as not demanding surgical interference of any kind. And for my purpose, it is only necessary to recognise the two classes of ovarian tumors—the solid and the cystic—and the two varieties of the latter—the *monocystic* or unilocular, and the *polycystic* or multilocular. So far, however, as most of the methods of treatment are concerned, we have the single sac or monocystic tumor on the one hand; while on the other, the polycystic and the solid tumor are to be grouped together, as will become apparent further on. Of the minute structure of either of these groups, it is not pertinent to my present purpose to speak.

When I speak of the *cure* of ovarian tumors, I mean the radical cure by extirpation of the diseased mass; or its diminution and arrest of development to such a degree that it is not afterwards perceived as an inconvenience by the patient during life. On the present occasion, I speak only of the latter form of cure, though I use the word under a protest, since the disease, in the cases termed successful, is rather *conquered* than *cured*, and this frequently only for a limited period. Some of the procedures of which I have now to speak are, however, merely palliative in their

* See Report of three cases, by Dr. Roemer, of Va., of ovarian sacs, said to be cured by iodine, by stomach and on abdomen—1 in 10 days, another in 15 days, the last in 5 months.—*Am. Jour. Med. Sciences*, Apr. '57, p. 332.

results. But, since many cases present themselves which admit of none but palliative treatment, these methods also are deemed worthy of a somewhat careful consideration.

The various methods proposed for the treatment of non-malignant ovarian tumors, may be arranged under the five following heads:—

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|--|---|------------------------------|
| A. Simple tapping, | { | 1. per parietes abdominales. |
| | | 2. per vaginam. |
| | | 3. per rectum. |
| B. Tapping, followed by pressure. | | |
| C. Tapping and formation of permanent opening in sac, | { | 1. externally. |
| | | 2. per vaginam. |
| | | 3. per rectum. |
| | | 4. internally. |
| D. Tapping, followed by injection of iodine. | | |
| E. Ovariectomy, or extirpation of the diseased ovarian mass. | | |

I merely mention here, also, the application of galvanism in these cases, since Jobert de Lamballe recommended it, though subsequent experience has not confirmed his opinion of its value.

But before considering these operative procedures in detail, I enter a protest against resorting to any of them with undue haste, or without sufficient grounds at the time, for the following reasons, viz. Non-malignant ovarian tumors do harm only in two ways—by exhausting the system, from the amount of elements they withdraw from the blood; and by mechanically interfering with the functions of the abdominal and the thoracic organs. So long, then, as none of these results are observed, there is still no occasion for haste in the adoption of any of the measures just mentioned. Certain objections, I am aware, have arisen to this proposition in the minds of some, the grounds of which, however, will, I think, be removed as I proceed.

I. SIMPLE TAPPING.

Simple tapping is to be regarded as a mere palliative measure in any case, though in a few instances, but always after several tapplings, the sac has not refilled after being thus evacuated. It may, however, be the only resort in some cases, especially when, from the patient's state of health, or the condition of the tumor, the radical cure by extirpation is not to be thought of. If, however, the tumor is not monocystic, and the fluid removed is not decidedly serous, we may be quite certain that the sac will refill, and generally in a much shorter period of time than at first. It is, however, a fact of great practical importance, that the tumors developed in the broad ligaments of the uterus, and which always have serous contents, are generally, and perhaps always cured by a single tapping. And I doubt not that many, if not most, of the

supposed ovarian tumors cured by simple tapping, were really sacs of this kind, since it is very difficult to distinguish them from ovarian sacs before the operation is commenced. I have cured this species of tumor by a single tapping. I have never cured an ovarian tumor in that way, nor do I know of any operator who has cured a tumor in that way, and could make it appear that it was not a sac in the broad ligament.

Still, we sometimes see cases of ovarian sacs, which are a year or even two or three years in refilling after being tapped. Simple tapping in such cases, therefore, may indefinitely prolong the patient's life, and perhaps render a resort to ovariectomy unnecessary. In such cases, however, the sacs are usually very large at the time of the first tapping, and the re-accumulation is quite rapid for three or four weeks, and then proceeds more gradually. I, however, recollect a patient who filled after each tapping at the regular rate of 2 lbs. per day, till the next operation became necessary; in one instance secreting 84 lbs. in 42 days, and the next time, 106 lbs. in 53 days. I also have the notes of another case, whom I tapped 4 times at intervals of about a year, she remaining quite comfortable during the greater part of each interval, though the sac was very large, and the quantity removed at the last two operations exceeds that obtained from any other patient whose case I can find recorded. The amount I removed by the last tapping was 149 lbs. and 3 oz. of fluid* by exact weight, her girth before the operation being 6 ft. and one half (78 inches). The fluid filled a large washtub, and $1\frac{1}{2}$ common sized buckets besides—or $7\frac{1}{2}$ buckets full in all. As I am positive that more than 13 oz. of fluid was lost on the carpet, I might fairly say the weight was 150 lbs. Tapping is therefore an important operation in the appropriate circumstances. The question therefore next arises—

When should simple tapping be performed?

When the tumor, being an encysted one, at length begins to impair the health of the patient, or produce great distress, or even jeopardize her life from its exhausting effects, or by seriously interfering by pressure with some important function—especially respiration and digestion—the question as to the propriety of simple tapping arises, and unless tapping with iodine injection is preferred, or ovariectomy—and I think the latter should very seldom be attempted till tapping has been at least once resorted to—in these circumstances we may, with propriety, resort to simple tapping. If, however, the case is one of polycystic tumor, and there are no sacs of large size, we may afford much less relief by the operation than we expected; and be obliged to repeat it much sooner than we had anticipated.

* At the preceding tapping of this patient, I removed 135 lbs. of fluid.

How perform the operation ?

Paracentesis abdominis is generally regarded as a very simple and safe operation. But reasons will appear for guarding as far as possible against accidents; and I call attention to a few points connected with it.

1st. I should advise to use a trocar and canula of larger size than is generally used, at least as large as a No. 13 bougie, if the sac be of considerable size.

2d. Always see that the bladder is evacuated before the operation is commenced.

3d. No bandage around the patient's abdomen during the operation, as usually advised, is actually necessary. Pressure by the hands of an assistant is, I think, to be preferred. After the operation, however, a bandage is always proper.

4th. It is generally advised that the patient be in a sitting position during the operation, while Prof. Simpson and I. Baker Brown adopt the recumbent position, the patient also lying on the side. Each of these positions has its advantages in special circumstances. I adopt the following rules in this respect. (1.) If the tumor is *monocystic*, I would, *ceteris paribus*, prefer the sitting posture. (2.) If the tumor is *polycystic*, I would adopt the sitting or the recumbent position, according as either would best secure the complete evacuation of the sac, in each particular case; and should expect to resort to the recumbent position in a majority of cases. But (3.) if the patient were so much debilitated that syncope is very probable, I would put her in a horizontal position, irrespective of the nature of the tumor.

5th. I should generally *incise* the skin with a lancet or scalpel, before using the trocar and canula; and *always*, if there be a thickness of half an inch or more of areolar and adipose tissue to penetrate. Of course large cutaneous veins are to be avoided.

6th. The *place* selected for the puncture by most operators is the point in the linea alba midway between the symphysis pubis and the umbilicus. I. B. Brown, however, prefers to puncture in the linea semilunaris, the patient lying upon the same side. (1.) In case of a *monocystic* tumor, I should prefer to puncture at the point in the linea alba just indicated, as the point least liable to be crossed by a vessel of sufficient size to give trouble. (2.) But if the tumor be *polycystic*, I would puncture at any point in the anterior aspect of the abdominal walls, above the level of the anterior superior spinous processes, and below that of the 8th rib, which promised the freest evacuation of the sac to be punctured. (3.) Having once safely operated at any particular point, I would perform all subsequent tapplings at the same point, if practicable. I have tapped at almost every point within the limits just mentioned, and have never had any troublesome hæmorrhage, except in a single case, and in this the puncture was made in the linea alba, as before specified. In this case, however, the omentum had

become adherent in the right iliac fossa, before the tumor had been developed, causing the latter to be covered by it in front. A vein in the thickened and very vascular omentum was wounded, and the patient died of the consequent hæmorrhage within 18 hours. I have sometimes tapped 4 different sacs of a polycystic tumor at as many different points on the abdominal walls, at the same time, without any subsequent trouble; and have often tapped 4 or 5 sacs with a curved trocar, all through the same external opening, with similar impunity. Of course, we incur the probable risk of puncturing the omentum also, if we puncture the abdominal walls much above the umbilicus; and must always do this if an umbilical epiplocele coexists with the ovarian tumor.

I should not omit to add, that some operators recommend that the puncture should be made *per vaginam*, instead of *per parietes abdominales*, as just described. If we propose to form a permanent outlet for the contents of the sac, tapping *per vaginam* with that end in view, may sometimes afford some advantages, as will appear anon.

But there are three considerations which I think sufficient to deter us from simple tapping of an ovarian sac *per vaginam*, under all ordinary circumstances, though Huguier advocates it, and thinks the danger has been magnified. These are, (1.) the vessels of the tumor are larger and more numerous at its lower part. (2.) If *polycystic*, the largest sacs are *not* at its lowest part. (3.) There is greater risk of wounding other organs by tapping *per vaginam*. Exceptional cases may, however, arise. Distinct fluctuation and evident thinness of the walls of the sac, detected *per vaginam*, may justify the operation through that canal, in case of a monocystic tumor; and in case of one of the sacs of a polycystic tumor being developed downwards, so as to occlude the vagina, in a married woman, this sac may in like manner be evacuated. I have twice performed the operation with this object in view; in both instances, however, without any permanent benefit, till I also, in one of them, injected the tincture of iodine. The sac had not refilled five years afterwards, when I last had an opportunity to ascertain the fact.

There is, however, a class of ovarian tumors in which *simple tapping per vaginam* is proper. I mean those complicated with ascites, and in which the ascitic fluid passing downwards into the Douglass *cul de sac* produces prolapsus of the vagina to a greater or less extent. Then the protrusion of the posterior vaginal wall, with the fluctuation, directly *invites* the operation. I have several times performed it in such cases, and never with any unpleasant results. But here the fluid is not in a *sac*, but in the peritoneal cavity. I have never seen an ovarian sac directly produce prolapsus of the vagina.

7. Lastly, I should evacuate the cyst as nearly as possible before removing the canula; and, if the fluid is very viscid and albuminous, I would also wash out the sac with warm water. In one

of my own, and I think in many other fatal cases of tapping, the adoption of this precaution would probably have prevented the fatal result, by preventing an irritating fluid from passing into the peritoneal cavity.

I ought, however, before passing to my next topic, to call attention to the fact that simple tapping—especially the *first*—is a far more dangerous operation than it is generally understood to be.

The statistics of first tapplings are very interesting in this respect. According to an essay published by Dr. Fock, of Berlin, in 1856, 25 out of 132, or 1 in $5\frac{1}{2}$, died within some hours, or a few days, after the first tapping. Prof. Kiwisch, of Wurtzburg, lost 9 out of 64, or nearly 1 in 7, within 24 hours after the first tapping. Of 20 cases of first tapping collected by Mr. Latham, of Manchester, Eng., 4, or 1 in 5, died in a few hours. Mr. Lee also mentions 36 cases, of whom 3 died within 24 hours, and 6 more in some days; or 1 in 4. Thus the fatality of first tapplings ranges between $\frac{1}{4}$ and about $\frac{1}{7}$ of the patients operated upon—or between 25 and 14 per cent. Dr. Meigs thinks nearly one half of the first tapplings he has witnessed in ovarian tumors proved fatal. The *causes* of death, in all tapplings, are generally inflammation of the walls of the sac,* or peritonitis, or hæmorrhage; and all these consequences of tapping are more liable to occur in cases of polycystic than of monocystic tumors; and I am free to admit, that I always tap one of these tumors for the first time with considerable apprehension, though of 3 fatal cases of first tapping in Cruveilhier's practice, two were monocystic tumors. In my own experience three fatal cases have occurred, all first tapplings, and all being polycystic tumors. The whole number of my first tapplings is 29. One of my patients died of hæmorrhage, as already explained; another of peritonitis, from the escape of some dense fluid left in one of the sacs into the peritoneal cavity; that escape having been produced by the patient's sitting up on the second day in opposition to my express directions; and the third died on the ninth day, of inflammation of the walls and dissepiment of the sacs constituting the tumor.

Is not the peritonitis following first tapplings generally due to the escape of some of the contents of the sac into the peritoneal cavity? I doubt not it is often so, and I would avoid it by completely emptying the sac, as heretofore explained, before removing the canula.

It would be a very interesting question to decide statistically, how large a proportion of the instances of death from a first tapping occurred in cases of cysts containing a clear serous fluid. I think the proportion will be found to be very small indeed.

It is doubtless with these results of first tapplings in mind, that

* Cruveilhier states that inflammation of the sac is always the cause of death, and not peritonitis. The walls of all cysts are very liable to inflammation, and pass easily into suppuration, or even gangrene; because a new-formed fibrous tissue exists in them.—*Am. Med. Monthly*, 1857, p. 24.

Kiwisch has discussed the question whether life is not shortened by tapping in cases of ovarian tumors, and has concluded that they do shorten life. I. B. Brown, of London, also endorses this conclusion. But if our statistics include *all* our other operations of tapping, as well as first tapplings, we shall find the mortality so slight as to render this opinion very questionable. Velpeau states that in thirty years he had tapped at least 310 times, and had had but four patients die closely after the operation, or 1 in $77\frac{1}{2}$ — $1\frac{1}{2}$ per cent. He does not state the number of his first tapplings included in his enumeration; but as he operated 38 times upon one of his patients, they might have been less numerous than his figures would at first lead us to suppose. The mortality in my experience has been 1 in 31—3 in 94. If, therefore, the operation is restricted to the cases I have before specified, and is then carefully performed, after delaying till the patient's condition demands it, as before explained, I think, in opposition to Kiwisch's conclusion, that life is evidently prolonged by simple tapping in cases of ovarian tumors.

Still, the operation may be performed too late as well as too early. It was so, I think, in the majority of the 130 cases of simple tapping mentioned by Dr. T. Smith; of which 69 (or more than half) were dead at the end of one year; and 114 more were known to have died eventually of the disease. (*L. Lancet*, May, '61, p. 435.)

II. TAPPING FOLLOWED BY PRESSURE.

This plan of treatment of ovarian tumors was suggested by I. Baker Brown, of London, in 1844, and his cases were reported in the *London Lancet* from that year to 1859. The prime objection to it is the suffering it gives the patient, though Mr. B. asserts, that if his own *method* be adhered to, it is by no means so unbearable as some have reported it to be; in fact, that it is generally not productive of any decided discomfort. The following is his own account of his operation, which, like any other, may fail, he remarks, from inattention and carelessness. "First of all, compresses of linen or lint should be so arranged as to present a convex surface, adapted as nicely as possible to the concavity of the pelvis. Over these compresses straps of adhesive plaster should be applied, so as to embrace the spine, meeting and crossing in front, and be extended from the vertebral articulation of the eighth rib to the sacrum. Over this strapping, either a broad flannel roller, or still better, a band with strings and loops which tie in front, may be applied; or a well made bandage, which by lacing in front may be gradually tightened. These bandages must be prevented from slipping upwards by a strap around each thigh. Both the compresses and the bandages will require watching and adjusting from time to time, lest by unequal pressure the bowels or bladder be subjected to inconvenience. Also the crest of the

ilium should be guarded with thick buffalo skin or amadou plaster."

Mr. Brown frankly admits that he at first anticipated too much from this mode of treatment, since, in many of the cases supposed to have been cured, the sacs subsequently refilled. He, however, reports six successful cases in his recent work on ovarian dropsy (pp. 100-9), the first three of which continued well at the end of 14, 12, and 8 years. The other three cases had not relapsed at the end of one, three, and three years. Finally, I add, this is to be regarded as a merely palliative measure, and should be but very seldom resorted to.

III. TAPPING, FOLLOWED BY THE MAINTENANCE OF A PERMANENT OPENING INTO THE SAC.

1. This idea was first carried into practice by Ledran, in 1836, who made an incision (about four inches long) through the abdominal walls into an ovarian sac, and kept it open by pledgets of lint, and a canula of sheet lead, for five months. The patient ultimately recovered. In another case, the discharge continued two years with a like result. It has been proposed by Mr. Tilt, of London, to produce adhesion of the sac to the abdominal walls by the application of Vienna paste, before making the incision, which method has been adopted by Recamier, Pereira, and others. This operation is, however, more fatal than even ovariectomy, and can properly find a place only in cases in which ovariectomy is rendered impossible by the existence of very extensive adhesions.

2. The same principle is, however, carried into effect in a somewhat less objectionable way by tapping the tumor in the usual way, or *per vaginam*, or *per rectum*, and leaving the canula *in situ* till the sac collapses and the discharge finally ceases. Of course, an exhausting discharge for months or years ensues, as in case the incision is used; and the result is so generally fatal that I cannot recommend the practice. It should be applied to simple sacs only, and the smaller the sac the greater the chance of final success. Briquet tried this method several times, but suppuration almost always destroyed his hopes*; and Dr. West had almost fatal peritonitis occur in two out of his three cases. Recamier and Michon have lost their cases from peritonitis. (Simpson's Lectures, p. 360.)

If this method be adopted at all, the tapping *per vaginam* is to be preferred. Scanzoni is said to have cured eight cases out of fourteen in this way. Kiwisch commended this operation very highly, and I should add that Dr. Schmetter, of this city, has made a very important improvement on Kiwisch's method. I discover no advantage in tapping *per rectum* under any circumstances, though

* *Am. Med. Monthly*, Jan. 1857, p. 23.

Tavignot prefers this method in all cases if the cyst can be opened from that canal.

3. I should also, in this connexion, speak of the method of forming a permanent opening of the sac into the cavity of the peritoneum. This is sometimes effected by removing a portion of the sac, and in others, by merely making a puncture in the latter. If a common trocar is used, however, the puncture closes in a day or two, and therefore Dr. Simpson proposes one with four instead of three cutting edges.

This operation is suggested by the recoveries which sometimes follow a spontaneous rupture of an ovarian sac, and the escape of its contents into the peritoneal cavity. But we are to remember that sometimes, also, fatal peritonitis occurs in consequence of such a rupture of the sac, the effect depending much, probably, on the nature of the fluid contained in the sac. Of 70 cases of spontaneous rupture of the sac, collected by Dr. Tilt, 30 died.* So the operation is not seldom followed by a fatal result. If the fluid is found by a previous tapping to be clear and serous, a disastrous result is far less probable; if dense and highly albuminous, or containing fibrinous flakes, the operation should not, I think, be performed under any circumstances. It may be tried in some cases of smaller monocystic tumors, though with no great prospect of success. Dr. Simpson has succeeded in one case (p. 355), and I think his method is best, viz. Use a large quadrangular trocar, and make it sure that the puncture does not close, by pressing the accumulating fluid from the sac into the peritoneal cavity from day to day, so long as there is a distinct accumulation.

IV. TAPPING, FOLLOWED BY INJECTIONS OF IODINE.

An ovarian tumor was first cured by the injection of iodine by Dr. Alison of Indiana, in 1846, who succeeded after repeating the operation several times in the same case. This method of cure had been first suggested by Velpeau in 1843, from the well known effects of iodine injections in cases of hydrocele,† though Robert first attempted it in France. Dr. Simpson, of Edinburgh, assisted Dr. Syme to perform the operation in 1851. Denman, Bell, and Hamilton had injected ovarian sacs, many years before, with sulphate of zinc, port wine, and other irritating fluids, but with such disastrous effects that the practice had been given up.

Many operators, and especially in France and Germany, where ovariectomy has found but little favor, have used iodine injections in the treatment of ovarian tumors, within the last ten years. They have also frequently been resorted to in Great Britain. But M. Boinet took up the subject so enthusiastically, and carried it out so scientifically, that he mainly is entitled to the credit of rendering it a recognised operation in the treatment of ovarian tumors.

* *Am. Med. Monthly*, May, 1859.

† This was first suggested by Mr. Martin, in 1832.

To what class of cases is this treatment adapted?

We can, evidently, never expect to inject all the sacs of a very compound polycystic tumor; and if we could succeed in arresting the development of even several of them, this would only make more sure the increase of the smaller ones in their turn. This is, therefore, a procedure not to be at all relied on, except in cases of single sacs. Of 11 cases of *polycystic* tumors injected by Boinet, 6 died, and 5 remained unchanged, and were considered incurable; while of 30 patients with single sacs, treated by iodine injections, 24 were cured, 3 seemed to be for a time, but relapsed, and 3 died. Still, it has sometimes been found that the development of a polycystic tumor has been for a time arrested, by injecting one or more of the largest sacs. In case also of one of the sacs of a compound cyst occluding the vagina or the rectum by its pressure, we may, perhaps, check the development of the mass in that direction by the method under consideration. I have succeeded in thus entirely removing pressure from the vagina in a single instance, as already stated. It will, however, be seen from the results of Boinet's experience, that this operation, in case of *polycystic* tumors, totally fails to cure, besides being far more dangerous than even ovariectomy. With the exception just mentioned, therefore, it will be understood to be restricted to monocystic tumors.

But are *all* monocystic tumors appropriate for the injection of iodine? Certainly not; for

1st. The *nature of their contents* exerts a great influence on the result of the operation. If the fluid is very dense and highly albuminous, the operation is not likely to succeed, for either of the two following reasons: 1st, the iodine may not, in such cases, act so directly upon the walls of the sac, and 2d, the iodine may coagulate the fluid within the sac. In both these cases, we may, however, perhaps remove the obstacle by thoroughly washing out the sac with warm water, after the fluid ceases to flow through the canula. Again, if the fluid contains *inflammatory products* (flakes of fibrine, &c.), the sac is probably still in a congested condition at least, and the injection may very likely produce inflammation of the sac, and which may be fatal.

2d. We have seen that a *first simple tapping* is a more dangerous operation than is generally supposed. I would prefer, therefore, that the patient should have recovered from *one* tapping at least, before the iodine injection is used. It is, however, not certain that the use of the iodine increases the danger of a first tapping; and if we are to judge from Boinet's experience alone, we should decide that it very much diminished that danger, since he had but 3 deaths out of 32 operations on 30 patients (or 1 in 10), while the average fatality of first simple tapplings is, we have seen, more than 1 in 7. Further experience must settle this question; meanwhile I shall seldom, if at all, use the iodine at the first tapping.

In deciding what tumors to treat by the iodine injection, I would, therefore, adopt the following rules:—

1. Reject all *polycystic tumors*, excepting the cases when we only expect to diminish for a longer or shorter time, a single one of the sacs.

2. Reject all monocystic tumors also, whose contents are *dense, viscid*, and *albuminous*, as a general rule; the exceptions presenting themselves in some cases where ovariectomy is out of the question.

3. Reject also all single sacs whose contents are made up in part of *inflammatory products*. No exception here occurs to me.

4. There remains, then, for the iodine injection, only the simple sac, with clear, serous contents, and this should have been tapped once at least, previously, as a general rule. Adherence to this last precept also enables us to decide, before we determine to use the iodine, whether we have a single sac, or more—a very difficult thing to determine in many cases before tapping.

I next inquire—

What curative results may be expected from the injection of iodine.

Presuming that in some cases no effect at all is produced—in *successful* cases the iodine injection arrests the secretion of the lining membrane of the sac, which subsequently contracts and remains permanently contracted. And Boinet reports that he often secured this result by a single injection. But it is a most important question how large a proportion of all the injections really succeed. The cases being well selected for the operation, Velpeau thinks more than half of all the patients operated on are cured;* while Dr. Simpson would reduce the number to only about one-third. According to statistics laid before the French Academy of Medicine, of 110 cases treated by iodine injections, 64 (or nearly three-fifths) were cured, 36 were not relieved at all, or only temporarily, and 10 (or 1 in 11) died. Dr. Gibb saw 3 cases cured out of 5.† Cruveilhier states that Nelaton cured 4 cases out of 10 or 12—the 4 cases having serous, and the others albuminous contents; while Boinet cured 24 out of 30 patients (8 out of 10) by 32 operations, having also 3 relapses.

Not all operators, however, by any means, have the success above mentioned; and some of the preceding cases very probably refilled after two or three years, since this is a common occurrence. Dr. T. Smith cured only 2 cases out of 12, 9 cases having refilled, and one having died within 48 hours. I. B. Brown reports 2 cases cured of about a dozen (pp. 110 and 116). Of 5 cases injected by Spencer Wells, two remained apparently well at the time of the report two years afterward; one began to refill after two years and was again injected; another refilled twice and was to be injected

* *American Med. Monthly*, 1857, p. 310.

† *Ibid.* p. 251.

a third time, and in the remaining one secondary cysts of a large size were subsequently developed.* Of 6 cases of my own, 1 was cured, 1 the sac still collapsed, 3 refilled, and 1 died. Jobert considers the operation quite a *harmless one*, and Cruveilhier states that he has operated 30 times without any accident.† Prof. Simpson had had but 1 death in 20 or 30 cases.‡ I have had 1 death in 6 cases, though perhaps not fairly attributable to the operation itself. Scanzoni operated four times and all four of his patients died. It must not, therefore, be looked upon as so harmless an operation as it is represented to be by Jobert. If, however, restricted, as I have suggested, to patients previously tapped one or more times, and to the kind of sac before indicated, the fatality would probably not exceed 1 in 10 or more, while its success would probably vary not much from 1 in 3. Still, it is often an important matter to *arrest* the secretion of a single sac for a time, and with this end merely, we may often find cases warranting its adoption.

In what form and of what strength is the iodine to be injected.

Solutions of iodine of very different degrees of strength have been injected into ovarian sacs by different operators. Mr. Bonnet, of Lyons, who generally kept the catheter *in situ* for some days or weeks, and repeated the operation several times, used, at first, a mixture of 100 parts of water with 100 of tinct. of iodine and 4 of iodide of potassium; he afterwards doubled the proportion of tincture, and when the cyst is considerably lessened, used the pure tincture. Prof. Simpson sometimes used the liquor iodinii compositus (Ed.) (8 grains iodine and 3 ss. potassii iodid. to $\bar{5}$ j. water); and sometimes the tinct. iodine (Ed.) ($\frac{1}{2}$ drachm. to $\bar{5}$ j. alcohol). This tinct. is one-quarter stronger than that made according to the U. S. formula. Dr. Bellows, of Cork, successfully used 3 ij. tinct. iodine comp. to 3 j. of distilled water. I. B. Brown uses the undiluted Edinburgh tincture, as do most of the English operators. I used the U. S. tincture undiluted. The *quantity* of the fluid used has varied with the size of the sac and other circumstances, from 1 ounce to even 14 ounces. Sometimes the whole amount injected has been left in the sac; at other's most of it has been passed out before removing the canula, for, with the exception of Mr. Bonnet, operators have removed the canula (or bougie) on completing the injection. I have always removed most of the tincture after assuring myself that I had brought it into contact with the whole lining membrane of the sac; believing that no advantage can accrue from leaving several ounces in the sac to be absorbed, while serious disadvantages may result. I, in one instance, injected 6 oz. and removed over 5 oz.

Future experience must decide what is the appropriate strength

* *Am Jour. Med Sciences*, April, 1860, p. 551.

† *Am. Med. Monthly*, 1857, p. 319.

‡ *Am. Jour. of Med. Sciences*, April, 1857, p. 481.

of the injection to be used, though the strong tincture proves to be quite safe, in most cases, and therefore I should prefer it. In respect to the *quantity* to be used, I think we should use only enough to come with certainty into contact with every point of the sac, and allow it to remain ten to fifteen minutes at least, and then remove the most of it, for the following reasons:—

1. Only the portion in contact with the sac exerts any change upon it; and any considerable overplus, especially if the sac is distended, increases the risk of some portions passing into the peritoneal cavity—a serious accident, as will be seen further on.

2. There is no advantage, as I believe, in leaving in the sac more than enough of the solution to cover its internal surface, though more may have been at first injected to make sure of its contact at every point. On the other hand, the danger above-mentioned is thus greatly increased, while at the same time the absorption of so large an amount of iodine, besides being totally useless in itself, generally produces great prostration and prolonged vomiting, which in a feeble patient might induce fatal consequences.

3. The use of a small quantity of the solution, and this mostly withdrawn in a few minutes, has, I think, been actually found quite as successful as the opposite practice.

How perform the operation.

Dr. Simpson has described a somewhat complicated apparatus, in his *Lectures on Diseases of Women* (p. 371), the object being to exclude the air from the interior of the sac. But as I do not attach any special importance to this matter, since it almost always enters to some extent, without any appreciable effects, in every case of simple tapping, I use merely the large canula before recommended, and a bougie No. 12 or 13 to match it, and a glass syringe, adapted to the latter, and holding 2 oz. or more.

When the tapping is completed, the bougie is passed through the canula to the bottom of the sac, and the iodine solution injected through the tube. If, however, the fluid from the sac is not a clear, serous fluid, but dense and viscid, warm water should be injected freely into the sac; and this should be repeated till we are assured that the lining membrane is completely cleansed of its adherent secretion. This being effected (and pressure of the sac will aid in effecting this object), we proceed, as before directed, to inject the iodine solution, which is retained in the sac 10 or 15 minutes, and is made to come thoroughly into contact with its internal surface, by kneading the sac with the hand. Most of the solution is then withdrawn, and the tube and canula removed, as before directed.

If the operator apprehends danger from the admission of air into the sac, the following manipulation, which I have generally adopted, will guard against it.

1. Fill the bougie with warm water by placing it horizontally in a vessel containing the latter; then placing the index finger of the left hand over its open end, pass it through the canula into the sac.

2. Depress the outer end of the bougie to a lower level than that of its extremity within the sac; take the syringe, filled by an assistant with the iodine solution, in the right hand, and adapt it to the tube the instant the left index finger is removed for that purpose. Thus a few drops of water are allowed to escape from the tube, but no air passes in the opposite direction.

3. The solution is next forced through the tube from the syringe, the tube being kept in the same position, or elevated, as the operator pleases. On detaching the syringe, however, to refill it, the tube should be in the same position as before indicated, and the left index finger reapplied as before, until the syringe is again inserted into the bougie.

This method of preventing the access of air may have occurred to others as well as myself; but as I have never seen it suggested, I take the liberty of speaking particularly of it. I have also applied it in cases of paracentesis thoracis.

What symptoms are expected to follow the injection.

It was predicted that the most fearful effects would ensue from the injection of iodine as I have described. Except, however, the class of inflamed ovarian cysts into which the injection should not be made at all, the dangers of the operation have, as I have shown, been greatly exaggerated. The *immediate* effects of the operation are also, usually, not very startling, unless a large amount of fluid be left in the sac. Since all the fluid left is to be eventually absorbed, we should expect severer symptoms, as I have already shown, from a larger quantity, though this principle seems to have been overlooked by writers on this subject. The *rapidity* of absorption is sometimes astonishing, since the taste of iodine may be perceived in a few minutes by the patient, and in half an hour the iodine may be discovered in the urine, the sweat, the saliva, the tears—in short, I. B. Brown remarks, in every secretion of the body (p. 112). In his own cases also (5 or 6 oz. of the solution having been left in the sac), great prostration and vomiting ensued, which was removed in 72 hours or more, by the use of stimulants. I have myself seen no such symptoms, though in all cases the pulse rose within three or four hours to 110 or 120, with high febrile reaction, which, however, disappeared entirely within 48 hours.

As a general rule, *no pain* whatever is produced by the injection. Boinet states that the iodine solution produces no pain while in an ovarian sac, but always, if it comes into contact with the peritoneum.* And I should regard severe pain or sudden shock,

* *Am. Jour. of Med. Sciences*, April, 1857, p. 481.

immediately after the injection, as a proof that some of the solution had passed into the peritoneal cavity. Dr. Lowenhardt, of Prenzlau,* had a patient who died in 14 hours after he injected a solution of 2 oz. tinct. iodine and 10 grs. iodid. potassium, in 2 oz. of distilled water. She complained of severe pain, with a sensation of approaching death, "from the entrance," he says, "of the first drop into the sac, which symptoms continued undiminished till death." The autopsy showed there was no trace of peritonitis, but in the cavity of the peritoneum was "a small quantity of a light brown fluid, which contained a small quantity of iodine." This last fact, I think, explains the symptoms, though the operator seems to have attached no special importance to it. Though this is to be regarded as an exceptional case, it shows the effects of the injection of iodine into the peritoneal cavity; and as it may not be possible in every instance to prevent its entering that cavity (for in this case only 4 oz. were injected into a sac from which 10 qts. of fluid had just been removed), we must take such a contingency into account in adopting the operation in any particular case. The removal, however, of as much of the solution as possible from the sac, as I have explained, will very much diminish this risk.

In regard to the *after treatment*, I have only to remark, that generally the same is required as after simple tapping. If intense febrile excitement, with prostration and vomiting, occurs, as in I. B. Brown's cases, stimulants and opiates will be required.

I conclude with the following propositions.

1. Simple tapping of ovarian sacs is merely a *palliative* measure, by no means to be regarded as a harmless one in any circumstances, and proving fatal in 1 case out of 7 (to 4) when resorted to for the first time.

2. All the *curative* methods I have considered, totally fail in cases of polycystic tumors, leaving ovariectomy alone as adapted to them. They all, moreover, in their application to monocystic tumors alone, give but a very slight promise of success, except the iodine injection, and, in a few cases, the tapping *per vaginam* and leaving the canula *in situ*. Besides, they are all, except the iodine injection and the formation of a permanent opening of the sac into the peritoneal cavity, as dangerous as ovariectomy, or even more so.

3. Of all the curative methods I have considered, the iodine injection alone (and the tapping *per vaginam* and leaving the canula *in situ*, in a few cases) is therefore to be commended, even in the treatment of monocystic tumors.

4. Iodine injections are valuable as a curative method, if restricted to single sacs containing a clear, serous fluid; thus proving successful in one-third to one-half of the cases. They may, perhaps, succeed, if the contents of the sac are albuminous, provided the fluid is completely removed from the sac by injections of warm water before the iodine solution is used. But the latter failing in either case, ovariectomy alone remains as a curative measure.

* *Am. Jour. of Med. Sciences*, April, 1861, p. 593.

5. Injections of iodine may, however, *retard the refilling* of simple sacs, and even of one or more of the principal sacs of a polycystic tumor; and may be used with this expectation merely, when ovariectomy is out of the question.

6. Iodine injections are not to be regarded as unattended by considerable risk; and which is also probably much greater in a patient never before tapped.

7. If in case of a monocystic tumor, circumstances compel us to reject the treatment with a curative intention by the iodine injection, and by leaving the canula *in situ*—ovariectomy becomes the sole curative method in this case also, as well as in all cases of polycystic and solid tumors.

